The prevalence of late-life depression in a Portuguese community sample: A 10/66 Dementia Research Group study

Introduction

Depression is frequent in older age (Djernes, 2006; Thielke et al., 2010). Despite considerable variation in findings according to diagnostic criteria, the prevalence of late-life depression has been extensively studied in high-income countries (Beekman et al., 1999; Djernes, 2006) and increasingly in low and middle income countries (Guerra et al., 2016). In Europe, the EURODEP studies found a global prevalence of clinically significant depression around 12% (CI 95% 11.8-12.9%), with higher rates in women and heterogeneity across different countries (Copeland et al., 2004). It is generally assumed that 10-15% of older adults at community level present a depressive condition at a given point in time, with only up to 3% meeting standardized ICD-10 or DSM-IV criteria (Baldwin, 2008; Beekman et al., 1999).

Clinical significance in depression means the level that a competent clinician would consider to merit some sort of intervention, and clinically significant cases do not always abide to ICD-10 or DSM criteria in old age. In fact, depressive symptoms and subsyndromal depression are more frequent in the community than depression cases estimated using structured diagnoses (Braam et al., 2014; Castro-Costa et al., 2007). The SHARE study (Survey of Health, Ageing and Retirement in Europe) in ten

European countries (Castro-Costa et al., 2007) reported higher prevalence rates for case-level depression using a validated cut-off for the EURO-D depressive symptoms scale (Prince et al., 1999b). Differences across countries were again highlighted, from 18-19% (Nordic and Central Europe countries) to 33-37% (France, Italy, Spain) (Castro-Costa et al., 2007). The term 'subsyndromal depression' may have different meanings: depressive syndromes with symptom counts not enough for a diagnosis of major depression; those with symptom counts not enough even for a diagnosis of minor depression; or as a synonym of minor depression (Baldwin, 2008). In any case, although depressive conditions which fail to reach cut-offs for a severe condition may lack the full validity or reliability of narrower and operationalized criteria for depression, they contribute to the burden of disease in communities.

Portugal did not take part in EURODEP or in the SHARE initial wave, and this European country is an exception in a group of nations where the study of late-life depression has been considerable. A first national psychiatric epidemiological survey was conducted, as part of the World Mental Health Surveys Initiative (WMHSI) and including adult participants of all ages (Caldas-de-Almeida et al., 2013; Kessler et al., 2015; Xavier et al., 2013). This nationally representative survey reported a prevalence of 1% (SE 0.2%) for dysthymia and of 6.8% (SE 0.5%) for major depression in the adult population, 26.5% (SE 2.6%) of these last cases being severe (Caldas-de-Almeida et al., 2013). Specific rates for the older age subsample (around 1/3 of the total) were not reported. However, the main WMHSI assessment instrument is the WHO-CIDI 3.0 (World Health Organization Composite International Interview), a structured psychiatric interview which is not specific for the assessment of depression in old age.

The population aged 65 years and older has grown from 16.4% to 19.0% between 2001 and 2011 in Portugal (INE - Instituto Nacional de Estatística, 2012) and it is therefore important to have accurate estimates for the prevalence of mental health conditions in Portuguese older people. In this context, we applied the validated 10/66 Dementia Research Group (DRG) protocols for the first time in Europe (Gonçalves-Pereira et al., 2017). Here we report findings on the prevalence of depression according to a variety of methods, including the Geriatric Mental State (GMS) (Copeland et al., 1986) generated criteria, which may better fit the assessment of depression in older age. We defined the following categories for depressive disorder: ICD-10, EURO-D and EURO-D only ('subsyndromal depression'). We also aimed to estimate the independent associations of depression with sociodemographic characteristics, economic circumstances and health status, and the association between depression and disability.

Methods

Study design, setting and participants

We applied the 10/66 DRG guidelines for prevalence studies (Prince et al., 2007). The 10/66 DRG main purpose has been to improve dementia-related epidemiological research in low and middle income countries (Prina et al., 2016; Prince, 2000; Prince et al., 2007, 2008). The 10/66 DRG protocols for dementia prevalence and incidence surveys are described elsewhere (Prince et al., 2007). A standardized operating procedures manual, covering training and field procedures, is available at

http://www.alz.co.uk/1066/. Our recent implementation of the 10/66 DRG prevalence-study protocols attempted to overcome the insufficiencies of community epidemiological research in Portuguese older people (Gonçalves-Pereira et al., 2016), and results regarding dementia prevalence have been published (Gonçalves-Pereira et al., 2017). However, 10/66 DRG studies have not been confined to dementia. Besides diagnoses of dementia according to the validated 10/66 DRG algorithm and to DSM-IV criteria, and of dementia subtypes, the method provides comprehensive assessments of sociodemographic characteristics, physical health, anthropometry, non-communicable disease risk factors, disability/functioning, use of services, care arrangements and caregiver strain, and general assessments of mental disorders (including depression) by using the GMS interview (Prince et al., 2007).

As reported in detail elsewhere (Gonçalves-Pereira et al., 2017), two catchment areas were mapped, one within Fernão Ferro, the other within Mora/Cabeção, in the south of Portugal. Fernão Ferro is an urban setting, with low and middle class residents. Total population is 17,059 (50.9% female; 18.9% above 64 years) (INE - Instituto Nacional de Estatística, 2013, 2012). Mora/Cabeção includes a small town in the middle of a rural area in the inner country. Total population is 3,595 (52.2% female; 32.4% above 64 years) (INE - Instituto Nacional de Estatística, 2013, 2012). We will address our two catchment areas, embedded within each of the described locations, as ‘urban (Fernão Ferro)’ and ‘rural (Mora)’. In each of them, all residents aged 65 and over were approached. These potential participants were 987 in the former and 731 in the latter catchment area, 1718 overall. Exclusion criteria were the impossibility of obtaining informed consent (e.g. refusals, unavailability at home, inability to consent together with unavailability of representative/next of kin) and, for the present study, being in a

nursing home. For each participant, a reliable informant was appointed (the closest family member, in most cases).

Measures

The full array of measures and corresponding details may again be found elsewhere (Gonçalves-Pereira et al., 2016; Prince et al., 2007). In short, we used: 1) the GMS, a semi-structured clinical mental state interview for older people, supported by AGECAT, a diagnostic algorithm based on clinical principles, identifying organicity (probable dementia), depression, anxiety and psychosis (Copeland et al., 1986); the GMS has been extensively validated worldwide (Copeland et al., 2002), including in populations with low education levels (Prince et al., 2004) as still displayed by a significant proportion of Portuguese elders (Gonçalves-Pereira et al., 2017); 2) a cognitive test battery, including e.g., the Community Screening Instrument for Dementia (CSI'D'); 3) a brief physical and neurological examination; 4) demographic and risk factor assessments, including the self-reported number of household assets (e.g. television, fridge/freezer, plumbed bathroom); 5) informant interview including further explorations or the validation of information regarding the participant (i.e. demographics and risk factors; functional assessments, including the World Health Organization Disability Assessment Schedule, WHODAS 2.0, 12 items). All instruments were already available as validated translations or were carefully translated and refined after back-translation procedures during the study preparation. Acceptability and conceptual equivalence were further assessed and reviewed during pilot studies.

The diagnosis of depression followed different criteria, all derived from the GMS-AGECAT (Copeland et al., 1986). Following the UK school of measurement in psychiatry, which tends to be phenomenologically based, the GMS mimics normal clinical interviewing, i.e. the gold standard of a competent clinician, taking 25-40 minutes to complete. The AGECAT computerized algorithm generates ICD-10 depressive episode diagnoses (World Health Organization, 1992), together with diagnoses of depression of clinical significance: EURO-D scale caseness. The EURO-D is a symptom scale originally developed to compare symptoms of late-life depression across 11 European countries in the EURODEP consortium (Prince et al., 1999b). It is derived from the GMS and covers 12 symptom domains: depressed mood, pessimism, wishing death/suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness. Each item is scored 0 (symptom not present) or 1 (present), total scores ranging from 0 to 12. Its cross-cultural measurement properties have been extensively investigated in Europe (Castro-Costa et al., 2008; Prince et al., 1999a) and in 10/66 DRG studies in non-western countries (Prince et al., 2004). An optimum cut-off point of 4 and over was validated for the identification of probable depression cases, and used in the SHARE surveys (Castro-Costa et al., 2007; Prince et al., 1999a; Prince et al., 1999b). Evidence of construct and concurrent validity of 'EURO-D depression' was also obtained in 10/66 international samples, where sensitivity for ICD-10 depressive episode was 86% or higher in all sites, and specificity exceeded 84% in all Latin America and Chinese sites (Guerra et al, 2015). As in other studies (Guerra et al., 2016, 2009), we use the term 'subsyndromal depression' to describe cases of EURO-D depression that do not meet full criteria for an ICD-10 depressive episode. The period prevalence of each condition was determined with respect to the past month.

Other recorded health conditions were: dementia, according to the 10/66 DRG diagnosis algorithm (Prince et al., 2003), self-reported stroke and a number of limiting physical impairments (including arthritis or rheumatism; eyesight problems; hearing difficulty or deafness; persistent cough, breathlessness, difficulty breathing or asthma; high blood pressure; heart trouble or angina; stomach or intestine problems; faints or blackouts; paralysis, weakness or loss of one leg or arm; skin disorders such as pressure sores, leg ulcers or severe burns).

Preparation, procedures and quality assurance

Field interviewers were mental health professionals, extensively trained in the assessment procedures. Training included exercises to improve inter-rater reliability, continued during pilot studies, and a two-day workshop on the administration of the GMS conducted by authorized, experienced trainers. Interviews were carried out directly in participant's own homes or scheduled to primary care or local community facilities, as convenient. All participants received the full assessment, which lasted on average 2-3 hours. Sometimes, given the length of evaluation procedures, interviews could be split (provided that assessments were completed within no more than one week). Data were collected directly onto laptop computers using computerized European Portuguese questionnaires driven by Epidata (version 3.1) software. These questionnaires had been developed by the 10/66 DRG, incorporating conditional skips and interactive checking of data consistency. Data were extracted into SPSS® (version 21.0), and cleaning, processing of derived variables, and diagnostic algorithms were done with SPSS syntax files. Besides thorough fieldwork interviewers' supervision,

quality control was assured by carefully reviewing every completed interview. A further random selection of interviews was checked. Personal identification data were stored in secure repositories, separated from interviews' data.

Ethical issues

Ethical approval was obtained from the Nova Medical School/FCM-UNL Ethics Committee (reference number 04/2012/CEFCM). Participants gave their written informed consent prior to assessments. In case they were unable to provide it, written informed consent was taken from their representative/next of kin.

Statistical analysis

Participant characteristics were presented as frequencies and stratified by study site. Chi-square tests were conducted to assess any demographic differences between the two sites. The prevalence of depression was estimated separately in urban and rural areas, and stratified by gender and age group with 95% confidence intervals adjusted for household clustering. We identified the prevalence of depression for each of the three outcomes: ICD-10 depression, EURO-D depression and sub-threshold depression (EURO-D depression not confirmed by ICD-10). The effect of socio-demographic factors (age, gender, education level and number of assets, receiving any pension), 10/66 DRG dementia, number of physical impairments, and history of depression was modelled using a Poisson regression model, and presented using prevalence ratios. Mean disability scores (WHODAS 2.0) were calculated by depression status. The

association between depression status and being in the top 90% percentile of disability levels was also calculated using Poisson regression. Finally, population attributable prevalence fractions (PAPF) were estimated for each depression status and stratified by geographical area. Data were analysed using the Statistical Package for the Social Science for Windows 21.0 (IBM SPSS, Inc.) and STATA (StataCorp. 2011. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP).

Results

General characteristics of the sample

After excluding all nursing home residents, participation rates of community-dwellers were 81.8% overall, 70.6% in urban Fernão Ferro and 96.9% in Mora. We therefore reached an analysable sample of 1405 older age participants, 697 in the urban area and 708 in the rural area.

Details on the general description of the two samples, urban and rural, were published (Gonçalves-Pereira et al., 2017) and are transcribed here with additional data **(Table 1)**. There were no significant differences in gender between the two areas. The urban participants tended to be younger, better educated, more likely to be married and to have more household assets, and less likely to live alone than their rural counterparts. Pension coverage was high in both regions, even if significantly lower in the urban

sample (86.1% *vs* 94.1%). Past depression was significantly more frequent in the rural area (45.5% *vs* 33.8%).

[INSERT TABLE 1 AROUND HERE]

Prevalence of depression

The overall prevalence of depression was 4.4 (95% CI 3.5-5.6) according to ICD-10 criteria and 18.0 (95% CI 16.0-20.1) using EURO-D criteria (**Table 2**).
EURO-D only cases (those that were diagnosed according to EURO-D, but not ICD-10) represented subthreshold depression: 13. 5 (95% CI 11.7 – 15.4).
The prevalence of ICD-10 depression was similar between the two sites, but EURO-D depression was almost double in the rural sample (more clearly so with EURO-D only/subthreshold depression cases). ICD-10, EURO-D and subthreshold depression prevalence rates were higher for women in the two areas, across all age groups (except above 80 years, in urban Fernão Ferro, where men tended to display higher prevalence rates in the last two categories). In women, there was a slight tendency for prevalence to peak in ages 75-79 years only for EURO-D and subthreshold depression cases, whereas in men prevalence tended to rise in the +80's group across all the three diagnostic categories.
To facilitate comparisons with previous studies, we also calculated the prevalence of depression in the overall sample excluding all participants with a 10/66 DRG diagnosis of dementia. In this subsample, we estimated a prevalence of 4.1 (95% CI 3.1-5.3) for ICD-10 depression, 17.0 (95% CI 15.0-19.2) for EURO-D depression and 13.0 (95% CI 11.2-15.0) for EURO-D only depression. Following Guerra et al. (2009), we finally

estimated the prevalence of stage 1 depression syndrome according to GMS-AGECAT (Copeland et al., 1986; Guerra et al., 2009), which was 20.4 (95% CI 18.0-23.6) in the urban sample, 23.7 (95% CI 20.7-27.0) in the rural sample and 22.1 (95% 20.0-24.4) overall (supplementary material 1).

[INSERT TABLE 2 AROUND HERE]

Correlates of depression

Table 3 presents data regarding some of the major correlates of depression. The prevalence of depression was not age-dependent or related to education according to any of the three diagnostic criteria. There was an inverse association of male sex with EURO-D depression in the rural area and in the overall sample, but this was not present with ICD-10 depression. There was also an inverse association with number of assets, again involving EURO-D and subthreshold depression only, and not in the urban area. On the other hand, depression was directly associated with a 10/66 DRG diagnosis of dementia (specifically for ICD-10 and EURO-D depression in the overall sample). However, this association was not consistent across the three depression criteria and the two areas). There were also direct associations with number of physical impairments (except in the urban area for ICD-10 depression, and in the rural area for subthreshold depression), and invariably with a past history of depression. There was no robust association with receiving any pension: this association was inverse in the urban area and regarding ICD-10 depression, and direct in the overall sample, regarding subthreshold depression (**Table 3**).

[INSERT TABLE 3 AROUND HERE]

When the residence status (urban vs rural) was added to the overall models presented in Table 3, we also found an association between urbanicity and ICD-10 depression (OR=1.71, 95% CI: 1.04-2.80). This relationship was not present when either EURO-D or EURO-D only depression were considered (data not shown).

Depression and disability

For those with subsyndromal depression (EURO-D only), levels of disability were higher than those of participants with no depression and lower than those with ICD–10 depressive episodes, according to both mean WHODAS 2.0 global disability scores and the proportion of participants in the 90% percentile of disability. This was so in both areas and in the overall sample. After adjusting for age, gender, education, assets, dementia, number of limiting physical impairments, history of depression and receiving a pension or not, both EURO-D only and ICD–10 depressive episode were independently associated with being in the 90% percentile of disability in both areas. Those with EURO-D only depression were two to three times more likely to report severe disability than non-depressed participants. The population attributable prevalence fractions suggest that 25.3% of the prevalence of severe disability in the urban area, 42.6% in the rural area and 32.4% overall could be independently attributed to depression. In each area, given the higher prevalence of subsyndromal compared with ICD–10 depression, a similar or greater proportion of severe disability prevalence was

attributed to subsyndromal depression compared with ICD–10 depressive episode (**Table 4**).

[INSERT TABLE 4 AROUND HERE]

Discussion

Prevalence findings and comparison with other 10/66 DRG studies

We conducted a comprehensive one-phase survey of two catchment areas, one urban and the other rural, in the south of Portugal. Following the 10/66 DRG protocol, we avoided middle-class or professional settings with high-income earners (in the urban area) and our choice for the rural one had lower population density and a more traditional agrarian lifestyle (Prince et al, 2007). Compared to the general population of Portuguese older people living in the community, the overall sample does not differ to a great extent regarding the distribution across age categories, gender, educational level, marital status and living arrangements (INE - Instituto Nacional de Estatística, 2012). Having reported dementia prevalence estimates (Gonçalves-Pereira et al., 2017), in this paper we focus on depression.

Our findings are broadly consistent with previous prevalence studies of old age depression, namely those using the 10/66 DRG methodology in low and middle income

countries and despite their substantial heterogeneity across different countries and cultures (Guerra et al, 2009; Guerra et al., 2016).

In our total sample, the prevalence rate for depression was about four times higher using the EURO-D definition (18.0%) than using ICD-10 criteria (4.4%). This much higher prevalence using EURO-D criteria had been reported across other 10/66 sites: e.g. 26.1%-31.2% versus 4.5%-5.1% in Peru, Mexico and Venezuela (Guerra et al., 2009), or 1.0%-38.6% versus 0.3%–13.8% in the update also including Cuba, Dominican Republic, Puerto Rico, China, India and Nigeria, involving over 17,000 participants in 13 sites from these 9 countries (Guerra et al., 2016). These figures were not different from those already known from European countries and have contributed to the debate on whether the strict use of DSM-IV or ICD-10 diagnostic criteria for research may systematically underestimate true depression prevalence in late life. It is noteworthy that the prevalence of EURO-D or ICD-10 depression was higher in most low or middle income 10/66 DRG centres (Guerra et al., 2016) than in our Portuguese overall sample.

We found EURO-D rates of depression in our rural sample that approximately doubled those in the urban one, a trend which was not previously seen in most 10/66 DRG studies (Guerra et al., 2016, 2009). Regarding ICD-10 depression rates, they overlapped in the two areas, again not consistently with most 10/66 DRG findings (Guerra et al., 2016, 2009). These differences between our findings and those in other 10/66 DRG studies are not easily explainable. There must be caution interpreting the role of urbanicity versus rurality in our sample, also given the results of including residence status in our overall regression model for the correlates of depression. Anyway, the trend towards a higher frequency of EURO-D cases in rural Mora was consistent with

more frequent reports of past depression in the same sample, in a Portuguese region where suicide rates are traditionally high, and among the highest in Europe (Santana et al., 2015).

Comparison with European and Portuguese studies using other methods to assess prevalence

Our findings are also broadly consistent with those reported for community-dwellers in other high income countries, namely in Europe (Castro-Costa et al., 2007; Copeland et al., 2004; Djernes, 2006). Comparing with SHARE, our EURO-D depression rates (18.0%) were nevertheless lower than those found in other South European countries (Greece, Italy, Spain), which were 24% or higher (Castro-Costa et al., 2007).

On the other hand, attempting a comparison with the first national epidemiological study in Portugal, we found (as expected) a higher prevalence of depression using the EURO-D case definition in our study. However, Caldas de Almeida et al's results in the general adult population and ours, in older people, are not directly comparable. This would still be the case if WMHSI results were available for older adults. Sampling methods were different and the present study's sample lacks national representativeness. On the other hand, their study did not include participants who were living in someone else's house (as may typically happen in Portugal with older people living with their adult children) nor people with dementia, whereas both were included in the present study. Other Portuguese community epidemiologic studies are now outdated despite their seminal nature (Barreto, 1984). At the primary care level, Gusmão estimated prevalence rates of 25-30% for any ICD-10 diagnosis of depression (including

dysthymia) in older age patients (Gusmão, 2005). Also at the primary care level, the Portuguese participation in a large European cohort study (the Predict-D study) allowed for a calculation of the cumulative 12 months' incidence of DSM-IV major depression in the national subsample: 8.5%. However, the Portuguese cohort was heterogeneous in age (mean age 50.2, SD=15.4, range 18-75 years), besides that dementia and incapacitating physical illnesses were among the exclusion criteria. Moreover, the main assessment was again the CIDI (King et al., 2008). Recently, de Sousa et al reported an estimation of 11.8% for depression prevalence in the 65 year-old or more Portuguese EPIDoC 2 (COReumaPT) cohort. However, this was a telephone survey and participants who answered the outcome measure (the HADS) were 70.2% of the EPIDoC 2 nationally representative sample (Sousa et al., 2017).

Major correlates of depression and assessment of disability

The correlates of depression that were more consistent across operational criteria in the overall sample were a 10/66 DRG diagnosis of dementia, number of physical impairments and mostly a past history of depression. Overall, WHODAS 2.0 scores and the proportion of participants in the 90% percentile of disability were higher in both depression groups compared to not having depression. As expected, disability levels in participants with ICD-10 depression were higher than in participants with subsyndromal depression (EURO-D only) cases. Considering population attributable prevalence fractions, a similar proportion of severe disability prevalence was associated with EURO-D and ICD–10 depression, highlighting the contribution of subsyndromal depression to the overall burden of disease in depression.

Strengths and limitations of the study

We used the 10/66 DRG protocols the first time in Europe. Prior to our study, comprehensive one-phase surveys estimating the community prevalence of depression in Portuguese populations aged 65 and over were scarce and did not use age-specific assessments. Using the 10/66 DRG protocols for prevalence studies allowed us to address simultaneously the main neuropsychiatric conditions in old age, cognitive impairment and depression, something not common in psychiatric epidemiological research (including previous Portuguese reports). Furthermore, this fostered the comparability of our findings. This one-stage catchment area survey has proven methodological advantages and is logistically straightforward (Dunn et al., 1999; Prince, 2003; Prince et al., 2007). The final sample size (n=1405) reflects a good participation rate for a Western European country such as Portugal. The choice of our urban and rural catchment areas tried to portray typical Portuguese scenarios. Regarding comparisons between the urban and the rural area, the same research protocol was implemented in both by the same research group, which warrants a regional comparison on solid grounds.

However, potential biases cannot be excluded given higher participation rates in the rural area. In urban Fernão Ferro, a higher number of eligible people refused to participate or could not be contacted: this could be partially explained by the fact that a proportion of households turned out to be weekend houses; additionally, weaker social networks perhaps undermined the confidence of potential participants in allowing interviewers to their homes. Other limitations must also be acknowledged. First, our estimates are not generalizable to the whole country (even if the characteristics of our

catchment areas, none of them atypical regarding Portuguese scenarios, favour external validity). Second, the validity of GMS-AGECAT/EURO-D depression diagnoses was not previously established in Portugal against gold standards such as evaluations by trained clinicians, using structured criteria for diagnosis. However, this was established in either high or low/middle income countries (Castro-Costa et al., 2008, 2007, Guerra et al., 2015, 2009).

Implications

Older age persons with depression represent a frail and important subgroup of the general population, as recognized by the leading documents of the National Mental Health Plan 2007-2016 (CNRSSM-Comissão Nacional de Reestruturação dos Serviços de Saúde Mental, 2008), which unfortunately was not fully implemented. Our study provides new and robust evidence to inform health policy makers' decisions.
By using the 10/66 DRG protocols for prevalence studies in Portugal, we paved the road towards gathering more evidence on old age depression in the community and to increase international comparability of epidemiological reports.

As in other studies we report a significant disparity between ICD-10 and EURO-D diagnoses, reinforcing the need to discuss our understanding of what constitutes a case of clinically significant depression (i.e. a 'case for treatment') in old age. ICD-10 tends to identify the most severe cases (e.g. with melancholic features), particularly in older adults. The majority of ICD-10 cases are also EURO-D cases, as confirmed by the sensitivity and specificity of the EURO-D scale to identify ICD-10 depression in Latin American/Chinese 10/66 DRG sites (Guerra et al., 2015). On the other hand, not all

EURO-D cases would meet the required level of severity in order to be considered for treatment, also because diagnosis relies more on the overall load of reported symptoms than on their combination pattern (Guerra et al., 2016). Notwithstanding, recent research on subsyndromal depression has provided reasonable evidence for low-level, low-intensity psychological and behavioural interventions in reducing the incidence of clinically significant depression, and improving quality of life in this group (van't Veer-Tazelaar et al., 2009; Wilkinson and Izmeth, 2012; World Health Organization, 2017). The high comorbidity with cognitive impairment is also important to consider in thinking through comprehensive, integrated care for people with subsyndromal depression, including in primary care settings. Overall, and despite need for caution in interpretations, our findings suggest that previous studies possibly underestimated the real depression prevalence rates in Portugal, as in other countries. Given the pace at which the Portuguese population is ageing (*Health at a Glance 2017*, 2017), and the overall burden of depression, alone or in comorbidity, a most demanding effort will be demanded from health and social sectors altogether. Only up to date, high quality epidemiological evidence will help planning efficient and integrated services to target depression, and its considerable burden of disease.

Overall, these results are consistent with those previously reported, in high and in low income countries. The prevalence of late-life depression is high, but varies depending on the criteria used for assessment. Regardless of this disparity, depression and associated disability pose a heavy burden on individuals and society.

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